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ON THE FLORIDA GROUND OWL (*SPEOTYTO FLORIDANA*).

BY WILLIAM PALMER.

Plate II.

UNIQUE, even among the many unfamiliar birds that a northern visitor sees in Florida, it is not strange that this bird should be always known, wherever it is found, by the distinctive appellation that I have used above and not by the usual *book* name of Burrowing Owl.

The habitat of the species lies some distance off the usual course of tourist travel, and to visit their haunts one has to tramp many miles over otherwise very uninviting prairie; thus few visitors to Florida have ever seen the birds, and even among the residents very little information can be obtained regarding its distribution and habits.

The Ground Owl is found in varying degrees of abundance throughout the central prairie portion of the southern half of the State, from Lake Kissimmee southward through the Kissimmee Valley. Westward its range extends as far as the prairies allow, even in the southwestern portion, to the vicinity of salt water. In some localities they are quite common, while elsewhere,

where the conditions are apparently similar, few or none can be found.

Of the bird but little concerning its habits has been written; few naturalists having had the opportunity of seeing it alive, and then only for a very limited time. Mr. S. N. Rhoads,[1] Mr. W. E. D. Scott,[2] and Mr. Walter Hoxie[3] are the only writers who have recorded any extended experience with the species. Some additional information is also given by Major Bendire.[4]

During March of last year, in company with Mr. Robert Ridgway and Mr. E. J. Brown, I collected a series of these owls from about the central part of the western bank of Lake Kissimmee and on both sides of the Kissimmee River in Polk and Osceola Counties to near Fort Kissimmee in De Soto County. No eggs were found, our last date for collecting the birds — March 20 — showing several burrows nearly finished.

Upon comparing the papers of Messrs. Rhoads and Scott various contradictions and agreements regarding their observations of the local habitats and habits of these birds will be noticed. They appear each to have found the birds in quite different situations, hence the differences between their observations. My own journey took me over both kinds of ground mentioned by these writers, and I am thus enabled to agree with both as to the correctness of their statements and to present something additional. Both writers, Mr. Rhoads especially, have given very interesting and perfectly correct descriptions of the peculiar topography of the region inhabited by these birds, and I shall content myself by adding but slightly to their accounts.

My first meeting with these birds was on the evening of February 26. While walking at dusk toward camp on the sand ridge bordering the shore of Lake Kissimmee, I noticed an owl standing near the mouth of a burrow placed about the center of the ridge *and less than thirty feet from the lake shore.* Almost at the same moment I saw another, its companion, flying low and alighting on

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[1] Auk, Vol. IX, Jan., 1892.

[2] Auk, Vol. IX, July, 1892.

[3] O. & O., Vol. XIV, 1889, p. 33.

[4] Life Histories of N. Am. Birds, No. I, 1892, p. 400.

the short grass a little way out on the prairie. I secured both birds and they proved to be a pair. No others were seen at the time and there was only one burrow at the place. Shortly after daylight the next morning, I again visited the spot, and secured another pair which I surprised out of the *same burrow.* The female of this pair is a very dark bird in fine unworn and unfaded plumage, much darker than any of many specimens subsequently secured (No. 150,150, U. S. N. M. Coll.). A few hundred yards up the same ridge and above our camp, Mr. Ridgway secured three pairs from about five burrows. All these burrows were placed at about the center of the highest and dryest parts of the ridge and were within forty paces of the lake shore. The highest parts of the ridge were hardly four feet above the lake level.

Mr. Scott says[1]: "The highest parts of the open prairie, away from the wooded 'islands,' the sloughs and ponds, seemed to be the places chosen by the birds for their burrows. I found none nearer than a quarter of a mile to any pond or slough." Again he says: "The situation of a burrow was always high, dry ground, and where there was some considerable growth of a kind of huckleberry." He thus found none in low wet places. Rhoads found all his burrows in entirely different situations; as he says,[2] "in the "margins of flat, grass-grown sand, of varying width, between the swamp and the saw palmettoes, and extending indefinitely in the direction of the stream." I found burrows and secured birds in both kinds of places mentioned by these gentlemen.

The Kissimmee Valley region is used almost entirely as cattle ranges, and in order to decrease the abundance of dead grass and other undesirable vegetation, and at the same time to increase the possibility of a new growth of grass for the cattle, the cowboys frequently, as the wind allows, set fire to the prairies in many places. Thus during our entire visit we could always see fire or smoke at several points on the horizon. It thus naturally happens that when the sandy areas of the prairies are a little higher and thus drier than the surrounding parts, these frequent fires prevent almost entirely any vegetation from taking root on such places.

[1] Auk, Vol. IX, 1892, p. 217.

[2] *Ibid.*, p. 4.

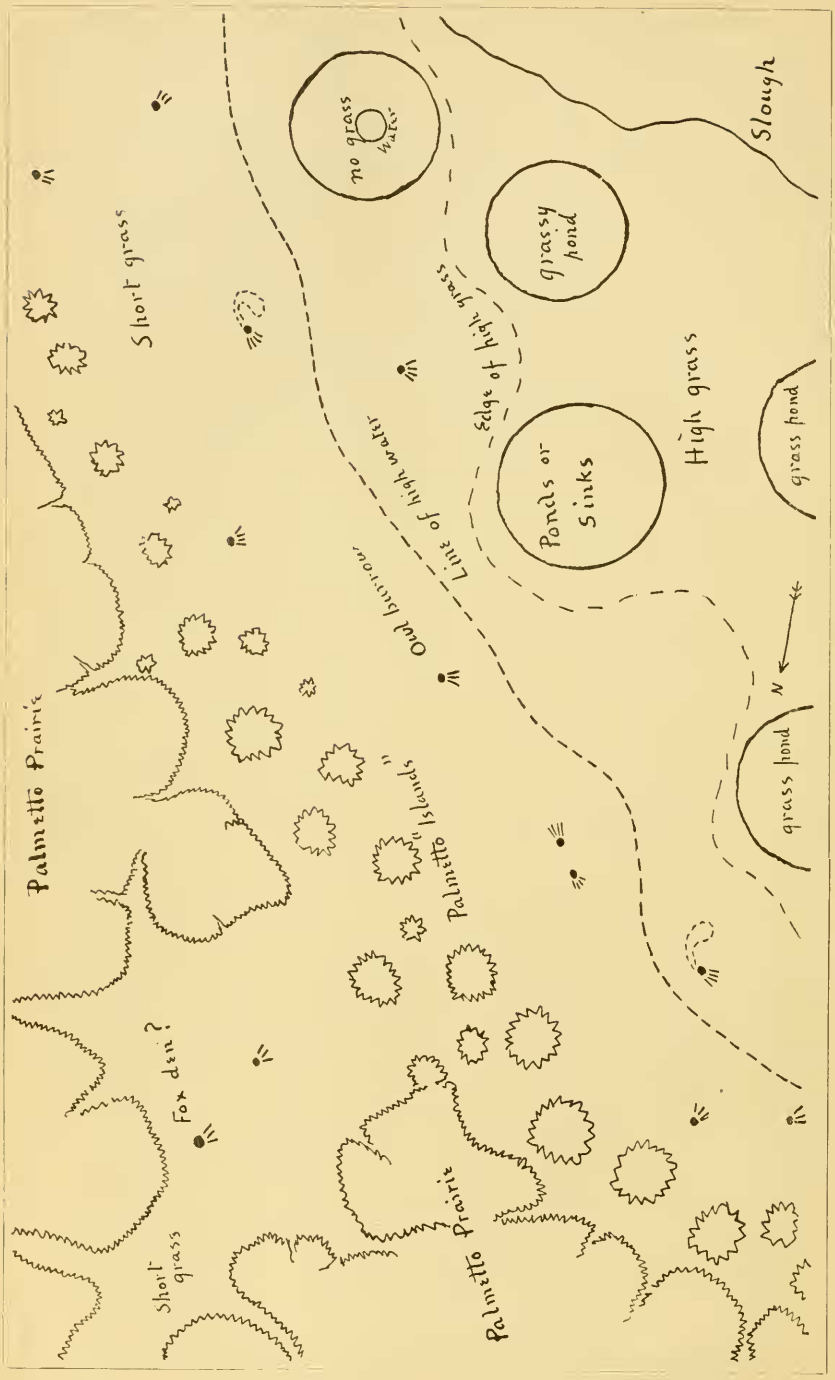


DIAGRAM SHOWING LOCATION OF A COLONY OF GROUND OWLS NEAR KISSIMMEE RIVER, FLORIDA.

These irregular patches of open sandy areas are found in various parts of the prairies but always on the higher ground, though I must confess that these last words seem out of place when describing a country where one can travel many miles without noticing a three foot rise of the ground. Such more elevated ground, when originally overgrown with saw palmettoes, are the usual burrowing places of foxes and skunks. The burning drives out these animals to more secluded quarters, and thus, as I believe, in time the Ground Owls take possession of their burrows. As the bareness of such places increases, other burrows are dug by the owls, thus accounting for the various shapes and sizes of these excavations. The strong odor of the mammals in some burrows from which I had just driven the owls, and their size as compared with burrows undoubtedly dug by the birds themselves convinced me of these facts. Within a few feet of some burrows was a shallower one but a foot or two deep, while about one I noticed a dozen or more shallow depressions, possibly the dusting places of Quails.

The commonest and I believe the original burrows of the Ground Owls are placed, as described by Mr. Rhoads, in the low, wet, grassy areas between the edges of the sloughs and ponds and the margins of the prairies. Such suitable breeding grounds extend for many miles, are rarely more than a few hundred yards wide, and follow the contour line of very high water. The diagram will show the character and general shape of these places. It is drawn from memory of a place near the Kissimmee River in Osceola County, where my friend Brown and myself secured eleven owls out of the burrows represented. On the left is an extensive prairie of scrub saw palmetto interspersed with open areas of grass and ponds with here and there at long intervals an 'island' or 'hammock' composed of two or more cabbage palmettoes, live oaks and gums separately or mixed, scattered or densely crowded, and sometimes growing in the water, but usually on a little elevation surrounded by a ring of water. At intervals through this prairie are the drier elevations before mentioned. At the edge of the prairie are many round 'islands' of saw palmettoes, from five to about fifty feet in diameter, and perhaps four to eight feet high. On the right, at a slightly lower level,

are many circular shallow ponds, usually a hundred or more feet in diameter, while beyond is the slough, extending irregularly parallel with the edge of the prairie.

Between the ponds and the palmetto 'islands' is the line of very high water, an almost flat sandy area densely carpeted with very short grass. About the center of this grassy area are the burrows of the owls, and here we found them in different stages of completion and at very irregular distances. At intervals offshoots of this grassy area extend irregularly into the prairie, and usually contain one or more burrows at or near their centers; in fact it is usual for the owls to locate at a spot about equidistant from the surrounding taller vegetation. In February these grassy flats are very wet, and many of them contain water, but as the water rapidly lowers by drainage and evaporation, the owls select a location and excavate in the wet sand. One place visited on March 4 contained water. On March 15, I secured a pair of birds from a new and unfinished burrow placed near the center and lowest part. The birds also undoubtedly re-use old burrows as was shown by the new deposits of sand on the old hills and through which grass was growing. That the owls dig out their own burrows here is very evident. Many examined on March 20 were in various stages of construction, some just begun, others fully excavated, while a few were finished, as was evidenced by the presence of pieces of dry cow droppings, grass roots and other rubbish in the tunnels and about the entrances of the burrows. Owing to their situation, the high water of the rainy season floods to some extent the sites of these burrows so that the owls are only able to inhabit the locality as the waters are receding. This flood line is shown by the debris of washed up grassy matter, and is indicated on the diagram. Thus at our visits the bottoms of the burrows were in very wet sand; indeed, owing to the flatness and the heavy dews, even the surface sand is very damp. As the season advances the burrows become drier and exactly suit the conditions necessary for the purposes of the birds. The rubbish carried into the excavation also tends to improve its habitable qualities. That the birds were pairing and seeking suitable breeding grounds during our visits is shown by the fact that several times when we secured one or both of the occupants of

a burrow, in a few days (in one case the same night) it was again reoccupied by a pair. Where the owls spend the time between the close of one breeding season and the beginning of another, I am unable to say. That they withdraw from their summer quarters is evident from the statements of people living in the vicinity.

Mr. Rhoads, in his paper cited before, says on page 6: "Every action of this species bespeaks a bird of eminently diurnal habits, but I have no reason to believe that they cannot range with equal freedom at night. From the nature of their food, however, I conclude they are more active in the daytime." Mr. Scott says also in his paper, page 218: "For I believe these birds to be strictly diurnal, doing most of their hunting, however, in the early morning and evening." As these gentlemen visited the haunts of these owls at the height of the breeding season, when many of the burrows contained young, the old owls were evidently forced by the demands of their numerous progeny to hunt in the daytime. In no instance did we find an owl away from the burrows except when frightened off by ourselves. Also I cannot agree with Mr. Rhoads that from the nature of their food they are more active in the daytime. All the stomachs examined contained remains of crayfish and beetles, which are certainly not animals whose season of activity is the daytime. In the tunnel of one burrow I found some feathers of a Savanna Sparrow. In the scratchings from the burrows, especially the old ones, minutely broken remains of crayfish were abundant, and in some cases we found about the mouths of the burrows what were certainly pellets, consisting of crayfish and beetle shells somewhat broken up. The nature of the material, containing no hair or feathers to bind it together, accounts for the rarity of pellets and for the abundance of the scattered remains in and about the tunnels.

Most writers mention that the male usually keeps watch at the mouth of the burrow and on the appearance of an intruder warns his mate with a low note of alarm. This was our invariable experience. My own observations convinced me that in every instance at the time of our visits to the owls (usually in the middle of the morning), the female was in the burrow while the male stood guard in the tunnel at the entrance. Upon slowly and quietly approaching a burrow, which could always be distinguished

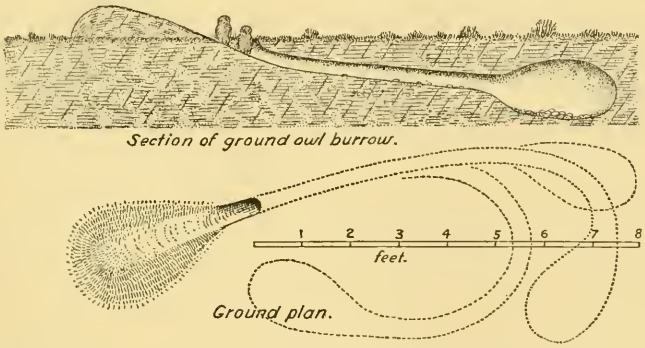
by the hillock of usually white sand at one side, the first seen of its occupants was the upper part of the head of one bird intently gazing in our direction. Upon a nearer approach a second head appeared at the burrow side of the first watcher while he moved up a little higher. Getting nearer they would move up more and more, when suddenly the first one, the male, would fly off for perhaps thirty yards. The female would remain a little longer and would sometimes run out of the tunnel and take a position facing us on the opposite side. If we remained stationary both birds would continue together, watching us intently as long as we stood unmoved, but it was always the first watcher that showed the most discretion by putting distance between himself and us upon our closer approach. In whichever direction they alighted they would instantly turn and, facing us, bow with the utmost gravity once or several times, as has been well told by Mr. Rhoads in his paper. If followed and flushed they usually returned to the burrow or some other, but rarely re-entered them unless wounded. In one instance a bird seeing the struggles of its mate flew directly into the burrow and disappeared, but an hour afterwards was found again on watch. A few of the male birds becoming alarmed would fly off into the palmettoes and hide, hence we collected more female than male birds. We saw no birds at work; possibly the female excavates the burrow while the male removes the accumulation of sand to the hillock. I doubt if any work is done while the sun is high.

That the males watch all day in the tunnels is perhaps shown by a comparison of the plumage of the sexes. Laying my series of skins in two rows, backs up, each row containing but one sex, it is noticeable at once that the females are much darker than the males (sepia brown[1]) and show extremely little buffy color on the back and wings. The males, on the contrary, are lighter colored (olive with a very slight yellow wash[1]). A few of the darker males approach the paler females in tint, but the darker wings and breast markings of the females readily serve to distinguish the sexes. Several specimens collected by Mr. Brown are quite blackish, but this was evidently caused by the birds having sought

[1] Ridgway's Nomenclature of Colors.

out beetles, etc., in the newly burnt prairie. Nearly all of the males and but few females show wearing of the outer edges of the secondaries and tips of the primaries and also of the wing-coverts. This wearing of the feathers is evidently caused by abrasion with the sides of the tunnel, and as the male spends most of his time during the day within the narrow limits of the tunnel, and perhaps has frequent cause for moving, it is but reasonable to suppose that his plumage should be more abraded, which is found to be the case upon comparing our specimens. This habit of the males of standing guard in the tunnels undoubtedly results in a bleaching of the plumage. The darkest and finest plumaged birds that we collected are all females, while the lightest colored and most worn and dingy specimens are all males.

There is some difference between the statements of Messrs. Scott and Rhoads regarding the direction in which the burrows open. Those found by us had no regular direction, but more perhaps opened to the westward than to any other point, which was perhaps due to the ground sloping slightly that way. In the diagram (p. 102) the location of a colony of owls is shown by the



burrows being marked as a black spot, the lines radiating on one side representing the direction in which the scratched out materials have been piled. In a few I have indicated the shape and direction of the burrow as examined by us. The distance from the first to the last burrow, as shown on the diagram, is about half a mile. Nearly all the burrows were occupied by a pair of birds, and were in various stages of completion, though none

contained eggs. The birds had evidently selected such a situation not only for ease of digging, but also for ease of observation against their natural enemies, skunks, rattlesnakes and such like. All burrows found except one had no vegetation except short grass immediately about the tunnel. This exception had on one side several tall, thin clumps of bunch grass. The burrows represented in the diagram may, in a sense, be said to form a community, though by using this expression I do not intend to convey any idea that these owls are really gregarious. Usually a community or colony contains about three to six burrows, and generally they are from thirty to over one hundred yards apart, though occasionally two will be found about fifteen or twenty feet from each other. Occasionally, also, a burrow will be seen at a considerable distance from any other, and again, many miles may intervene between colonies; in short, the birds seem to require peculiar conditions of environment, as indicated above, and also to have in slight degree some gregarious feeling, which leads them to locate with their fellows if there is adequate room.

A comparison of the color of the feet of thirteen specimens, all collected at the same place and at the same time, presents considerable contrast. In about half of them the feet and lower portion of the tarsi were uniformly dark and but slightly paler beneath. The remainder showed a variety of changes from one which had the feet and lower third of the tarsi a dullish lemon yellow to the other extreme in which the yellow was confined to the soles. As this color is evanescent it does not show in dried specimens.

My use of a binomial name for this bird requires perhaps some explanation. A comparison of about sixty specimens of *floridana* with an equal number of *hypogæa* shows them to be distinct. As the habitat of the Florida bird does not approach that of *hypogæa* nearer than about eight hundred miles, and is also separated from its relatives in the West Indies and South America by vast areas of water, and as intergrading forms are unknown, I see no good reason why *floridana* should not rank as a species.

Again, as the use of a trinomial implies direct relationship with the specific form, through known intermediate and intergrading specimens, which certainly do not exist in this case, I can see no reason why *floridana* should be made a subspecies of the South American *cunicularia*.